REMARKS

Claims 1, 5, 6 and 9-11 are pending in this application. By this Amendment, claims 1, 6, 9 and 10 are amended and claim 11 is added. Support for claim 11 can be found, for example, on pages 17 and 18 of the originally filed specification. No new matter is added.

The Office Action objects to claims 9 and 10 for informalities. By this Amendment, claims 9 and 10 have been amended responsive to the objection. Applicant respectfully requests that the objection be withdrawn.

The Office Action rejects claims 1 and 6 under 35 U.S.C. §112, second paragraph, for allegedly being indefinite. Specifically, the Office Action alleges that the term "fine" is indefinite. Applicant asserts that "fine" is a term of art that would be understood by one of ordinary skill; however, claims 1 and 6 have been amended to delete the term "fine," responsive to the rejection in order to advance prosecution. Applicant respectfully requests that the rejection be withdrawn.

The Office Action rejects claims 1, 5, 6, 9 and 10 under 35 U.S.C. §103(a) over Fenton et al., U.S. Patent No. 6,638,659, in view of Hiroshi et al., JP 05-299105. Applicant respectfully traverses the rejection.

Claim 1 recites "a compact substrate having hydrogen-permeability." The Office Action admits that Fenton fails to disclose these features but alleges that Hiroshi overcomes the deficiencies of Fenton and that it would have been obvious to one of ordinary skill in the art to combine Fenton and Hiroshi. Applicant respectfully disagrees.

Fenton discloses a porous electrolyte membrane having high conductivity at high temperatures. Fenton's porous electrolyte membrane includes an ionomeric binder and an ionically conductive solid. As the base material for the electrolyte membrane, self-contained organic materials like PTFE and PEEK are used. The porous electrolyte membrane also has an anode and a cathode disposed on either side of it.

Since Fenton uses self-contained organic materials for the base material, there is no technical reason for using a base material (the claimed compact hydrogen-permeable substrate) that supports an electrolyte for forming an electrolyte membrane. In particular, a compact substrate having hydrogen-permeability is used in the claimed invention because it is necessary for forming "a porous layer having pores, wherein the porous layer is inorganic and comprises a thin film, multiple layered porous body" as recited in claim 1. If the compact substrate is not hydrogen-permeable, hydrogen is not supplied to the electrolyte membrane and the fuel cell cannot perform its intended function. Thus, Fenton does not disclose, nor would it have rendered obvious, a compact substrate having hydrogen-permeability.

The Office Action alleges that Hiroshi overcomes the deficiencies of Fenton. Applicant respectfully disagrees because Hiroshi only uses palladium (the alleged hydrogen permeable membrane) for selectively taking out hydrogen from a reform gas (so called direct reforming), and only uses a perfluorosulphonic acid (PFSA) exchange membrane for an electrolyte membrane 11. Hiroshi does not disclose, or suggest, a configuration that directly disposes a porous electrolyte membrane on the surface of the palladium. This is because Hiroshi only uses the palladium for direct reforming, and uses a general electrolyte membrane for an electrolyte membrane. In Hiroshi, there is no need to form a thin porous electrolyte membrane and there is no technical reason for using a compact substrate (as called for in claim 1) and therefore necessitating hydrogen-permeability for the base material.

Neither Fenton nor Hiroshi provides any technical reason for forming a compact substrate having hydrogen-permeability or a porous layer with pores, wherein the porous layer is inorganic and a thin film, multiple layered porous body. Accordingly, even if the references are in the same field of endeavor (fuel cells), they belong to different types of fuel cells that would not have been combined by one of ordinary skill in the art at the time of the invention. Specifically, Fenton's disclosure is directed to a configuration comprising an

electrolyte membrane and an ionically conductive solid to achieve high conductivity in high temperatures whereas Hiroshi uses palladium for direct reforming, and there is no motivation for combining Fenton and Hiroshi. Further, even if Fenton and Hiroshi were combined, which Applicant does not admit would have been obvious to one of ordinary skill in the art, the resultant configuration would only be palladium disposed on the outside of Fenton's anode, not the claimed compact substrate having hydrogen-permeability and a porous layer with pores, wherein the porous layer is inorganic, and a thin film, multiple layered porous body.

Furthermore, Fenton uses organic materials like PTFE and PEEK as porous matrices. One of ordinary skill in the art would not have interpreted these matrices as being inorganic and therefore Fenton fails to disclose, or to have rendered obvious, a porous layer with pores, wherein the porous layer is inorganic.

Claim 6 recites "preparing a compact substrate having hydrogen-permeability; forming, directly on the substrate, a porous layer having pores, wherein the porous layer is inorganic and comprises a thin film, multiple layered porous body." Thus, claim 6 is patentable at least for the reasons discussed above with respect to claim 1.

Claims 5, 9 and 10 are patentable by reason of their dependency from one of independent claims 1 and 6, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

Claim 11 is patentable because none of the applied references disclose, or would have rendered obvious, all of the features of claim 11.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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